

DEC 14 2006

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Application No.: 10/519,822
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IN THE SPECIFICATION:

Please replace the paragraph beginning on page 1, line 25 with the following amended paragraph:

In order to benefit from the capabilities of the transmission system, the future generation of phones will have a large display in order to perform multimedia input and output, and the picture quality will be of high importance. Still, the keypad or keyboard must be large enough to allow people to press one key at the a time.

Please replace the paragraph beginning on page 1, line 29 and ending on page 2, line 4 with the following amended paragraph:

Figure 1 discloses a typical example of a state of the art mobile phone or communication terminal 1, carried by a housing or chassis 2. The size of a keypad 4 and a display 3 basically sets the limit of how small the terminal 1 can be. However, to be able to work as a standard phone for voice interaction, the terminal 1 also includes a microphone 5 and a speaker 6, preferably arranged at opposite ends of the terminal 1. Figure 3 discloses a different embodiment of a state of the art communication terminal 1, wherein the display 3 occupies a larger portion of the front side of the terminal. Several of the functions of the keypad 4 have been included in a graphical user interface applicable to the display 3, rendering a data input interface having less keys. Those keys 4 may also be moved to the side of the communication terminal in order to allow for the display 3 to occupy a larger portion of the front side of terminal 1. A specific tool 8 may be provided for inputting data on a touch-sensitive screen of the display 3. Figs 1 and 3 show two typical examples of state of the art communication terminals 1, whereas the skilled persons will realise that combinations of the two are also well known as well as other designs.

Please replace the paragraph beginning on page 2, line 5 with the following amended paragraph:

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With the development of the communication systems and the capabilities of multimedia functions, the demands on the sound quality from the terminals will also increase. In the next generation of terminals using Wideband Code Division Multiple Access (W-CDMA) ~~W-CDMA~~ technique, it will be possible to user a wider audio frequency band. The speaker of the terminal may also be used as a ringer instead of a traditional buzzer, for a single tone or polyphonic ring signals, and as a hand free speaker built ~~built-in~~ into the phone. Normally, these functions are performed by a second speaker mounted in the back of the phone, but combined speakers for two or all three of these functions exist.

Please replace the paragraph beginning at page 2, line 24 with the following amended paragraph:

The performance of the speaker is to a high extent dependent on the back volume, i.e., the acoustic resonance cavity behind the speaker. For best performance, the back volume should be sealed. In a normal case the whole phone is used as a back volume, but it is almost ~~possible~~ impossible to seal a phone. As mentioned above, almost every phone today has the speaker position in the upper parts of the front of the terminal above the display and keyboard. This means that the height of the speaker, display and the keyboard determines the length of the phone. Since the speaker performances is highly dependent on the dimension, reduction of the speaker size results in less good acoustics. There is also a general desire to have larger displays in the communication terminal, not just wider by also longer, and with the common layout of the keyboard such as disclosed in figure 1 and which people are used to, the height of the terminal can basically not be reduced more than today without resulting drawbacks to the display 3 or keypad 4.

Please replace the paragraph beginning at page 5, line 3 with the following amended paragraph:

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The present description refers to communication terminals as a device in which to implement the speaker configuration according to the present invention. The communication terminal includes all mobile equipment devised for radio communication with a radio station, which radio station may also be a mobile terminal or e.g. a stationary base station. Consequently, the term "communication terminal" includes mobile phones, pagers, communicators, electronic organisers, smart phones, PDA:s (Personal ~~Digit~~ Digital Assistants), vehicle-mounted radio communication devices or the like, as well as portable laptop computers devised for wireless communication in for instance WLAN (Wireless Local Area Network). Furthermore, since the design and present invention is suitable for but not restricted to mobile use, the term "communication terminal" should also be understood as to include any stationary device arranged for radio communication, such as for instance desk top computers, printers, fax machines and so on, devised to operate with radio communication with each other or some other radio station. Hence, although the structure and characteristics of the antenna design according to the invention is mainly described herein, by way of example, in the implementation in a mobile phone, this is not to be interpreted as excluding the implementation of the inventive design in other types of radio terminals, such as those listed above. Furthermore, it should be emphasised that the term "comprising" or "comprises" when used in this description and in the appended claims to indicate included features, elements or steps, is in no way to be interpreted as excluding the presence of other features, elements or steps than those expressed or stated.

Please replace the paragraph beginning on page 6, line 31 and ending on page 7, line 5 with the following amended paragraph:

By placing speaker 16, and cavity 21, behind the user interface, i.e. the display 13 or keypad 14, the height of speaker 16 does not add to the length of terminal 11. Instead, only the height of the outlet 17 of sound channel 22 will add to the length of the phone. This is shown for the first type of communication terminal 11 of fig 2, which should be compared to the state of the art terminal of fig 1. The terminal 11 of fig 2 is obviously shorter in the longitudinal direction than terminal 1 of fig 1. For the second type of terminal the inventive design is

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disclosed in figs 4 and 5. Comparing the embodiment of terminal 11 in fig 4 with the state of the art terminal 1 of fig 3, terminal 11 is clearly smaller. However, instead of making the entire terminal smaller, it is of course possible to use the space otherwise occupied by a speaker to increase the user interface, in the example of fig 5 by including a larger display 13. In the embodiments of figs 4 and 5 as well as the state of the art terminals of fig 3 an auxiliary tool 8 18 may be used to interact with the phone by pressing touch sensitive areas of display 3, 13 in a manner well known in the art.

Please replace the paragraph beginning at page 7, line 15 with the following amended paragraph:

In Fig. 7A a state of the art terminal much like the one in Fig. 1 is shown from the front side. In Fig. 7B the same terminal is schematically illustrated from the side in a sectional view with the front side facing left. In this drawing a number of elements normally include in a radio communication terminal or disclosed. It should be emphasised, though, that the dimensions are merely exemplary to illustrate the contribution and advantage of certain features of this embodiment of the invention. Furthermore, connections between the different elements of the terminal are not shown. A ground plane 24 is arranged in the terminal extending longitudinally through a part, or substantially the entire body, of the terminal. Normally, this ground plane is a layer of a printed circuit ~~bears~~ board carrying the electronics of the terminal. A speaker 6 is placed at the front side of the terminal over the ground plane as seen from the front side. The back of the speaker is coupled to the cavity 21, placed behind the ground plane, through an opening in the ground plane as illustrated in the drawing. The back wall of cavity 21, i.e. the wall opposite to the ground plane, carries an antenna element, e.g. in the shape of a PIFA. A user interface comprises a display 3 and a key pad 4, and a microphone 5 is placed at the bottom of the terminal. A battery 9 is further included to supply the terminal electronics with electrical power.